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# Findings from twenty years of working with custom harvesters

**Southern Agricultural Economics Association Annual Meeting  
February 3-6, 2018  
Jacksonville, FL**

**Craig Smith  
Kevin Dhuyvetter  
Terry Kastens**



U.S. Custom Harvesters Inc.



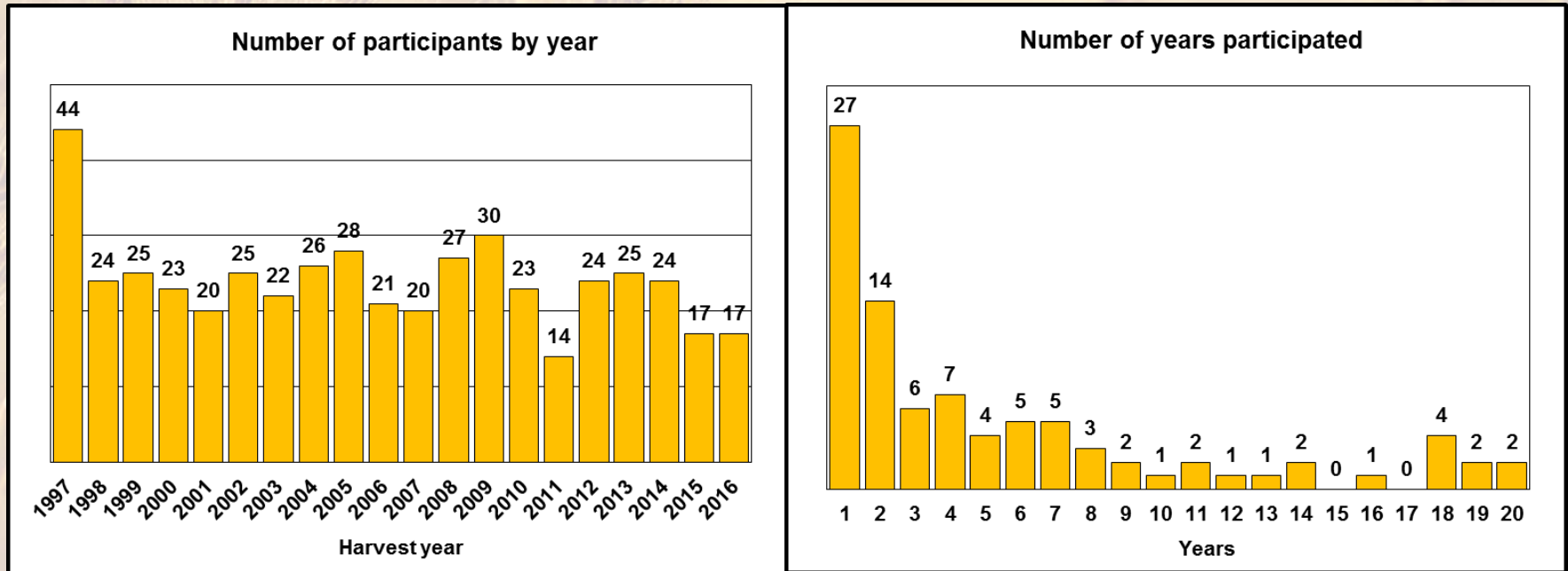
FORT HAYS STATE UNIVERSITY  
WERTH COLLEGE OF SCIENCE, TECHNOLOGY AND MATHEMATICS  
Department of Agriculture

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# CHAMP: a survey based program Over the years . . .

- **Participation**

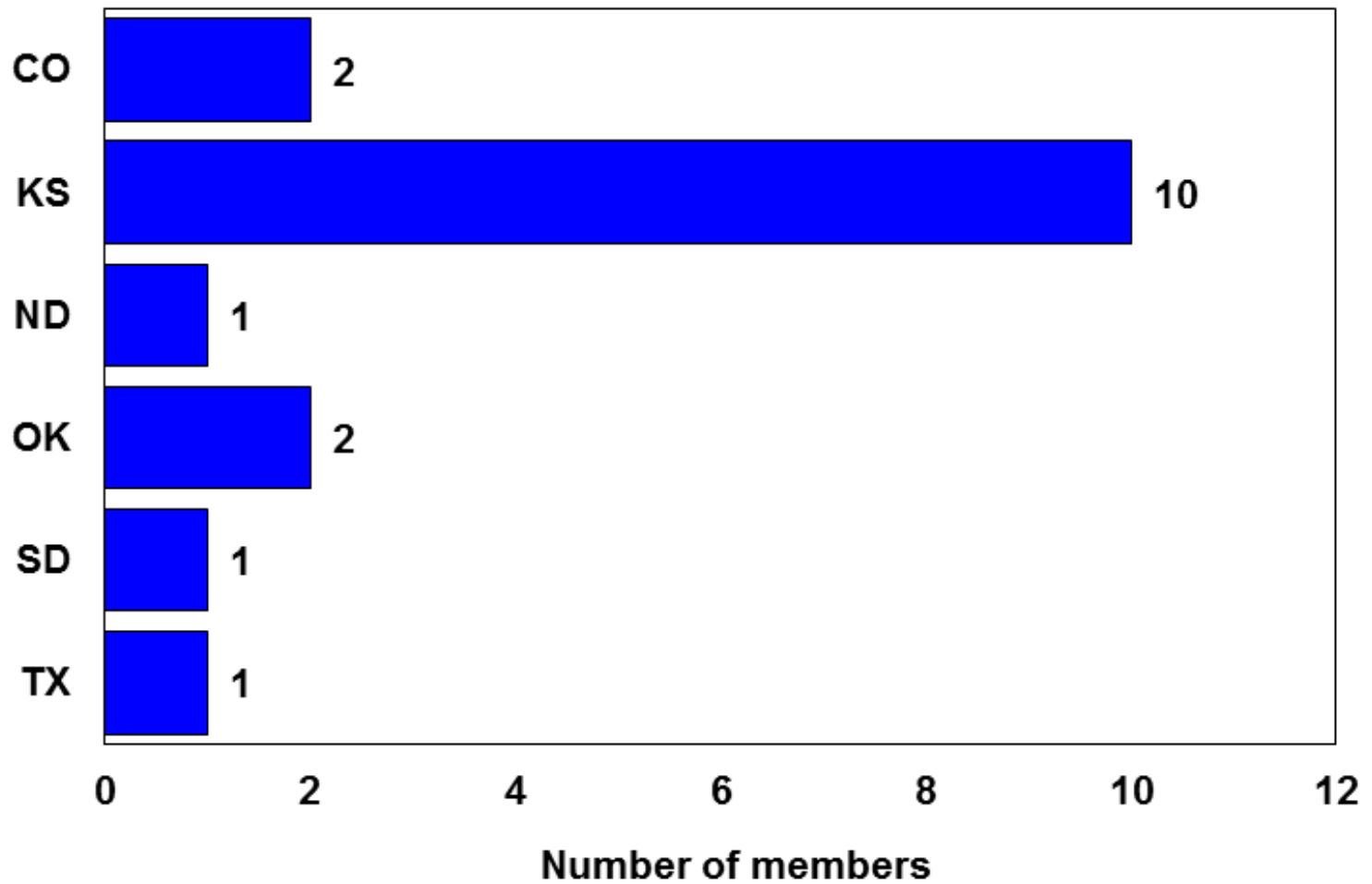


- **Repeat members**
  - 13 of 17 2016 members were in 2015 (1 new)
  - 2 members have participated all 20 years

# General Information

- **Location**
- **Age of manager**
- **Business structure**
- **Years in business**
- **Age and number of combines**
- **Relative importance of business**
- **People involved in business**
- **Number of customers**

## State where business is located

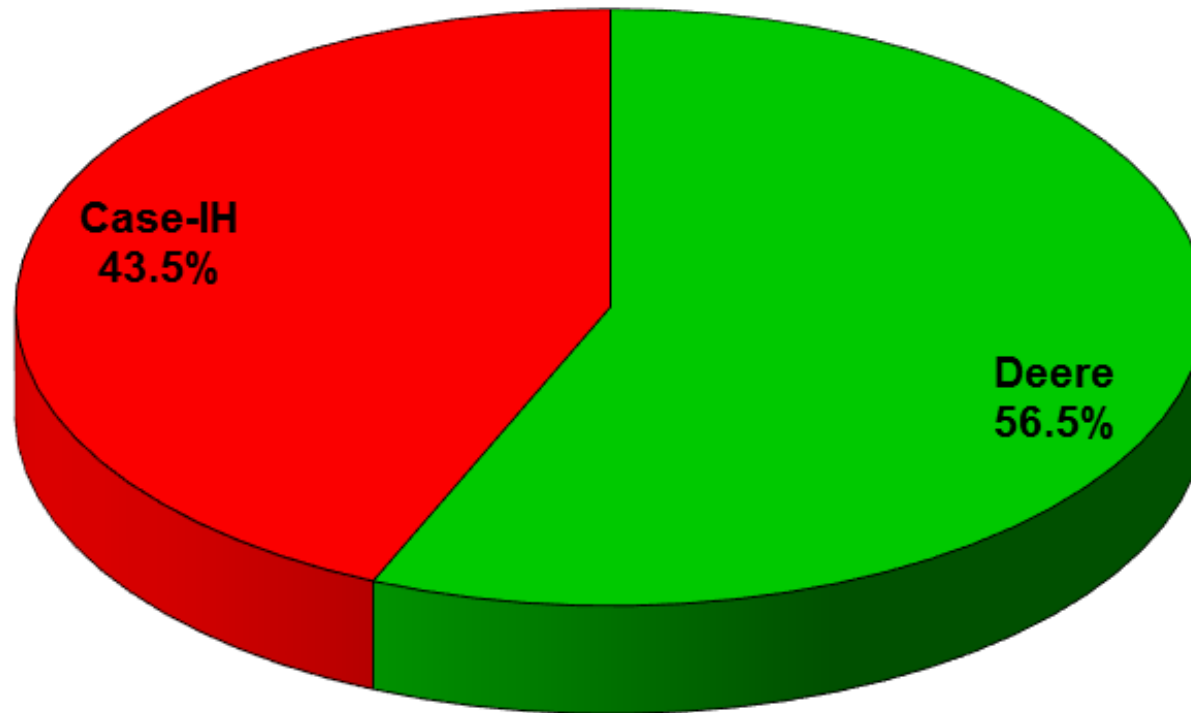


# More Miscellaneous Information

- **Employee breakdown (season peak)**
  - Family employees average was 31.7%
  - Foreign employees: avg across members 22.4%, 21.5% of total employees
  - Average employees/combine was 3.18
- **11 of 17 (64.7%) finance some or all of their combines through dealers/manufacturers**
- **3 of 17 (17.6%) get combine insurance through dealer/manufacturer**
- **Average interest rate was 4.25%**
  - 2015-4.30%; 2014-4.02%; 2013-4.29%; 2012-4.68%; 2011-4.97%
  - Minimum in 2016 = 3.40%
  - Maximum in 2016 = 5.98%

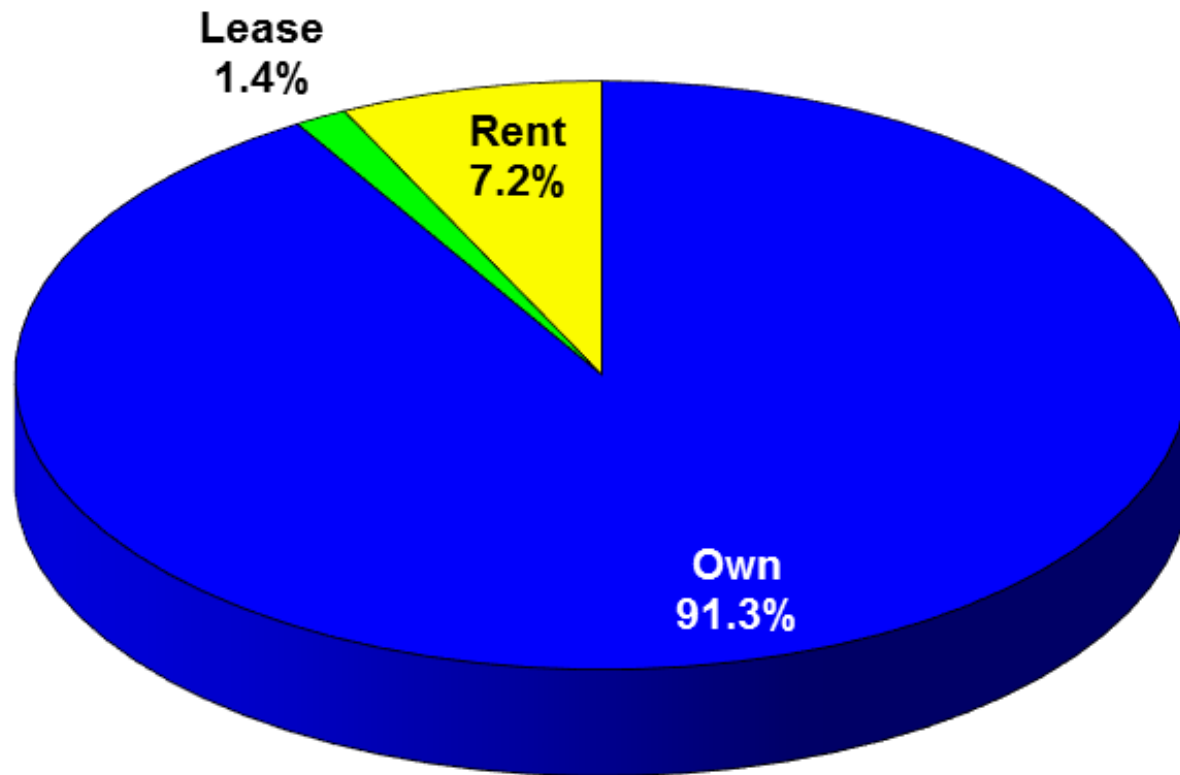
## Brand of combines used in 2016 in survey

(total = 69)  
Other  
0.0%



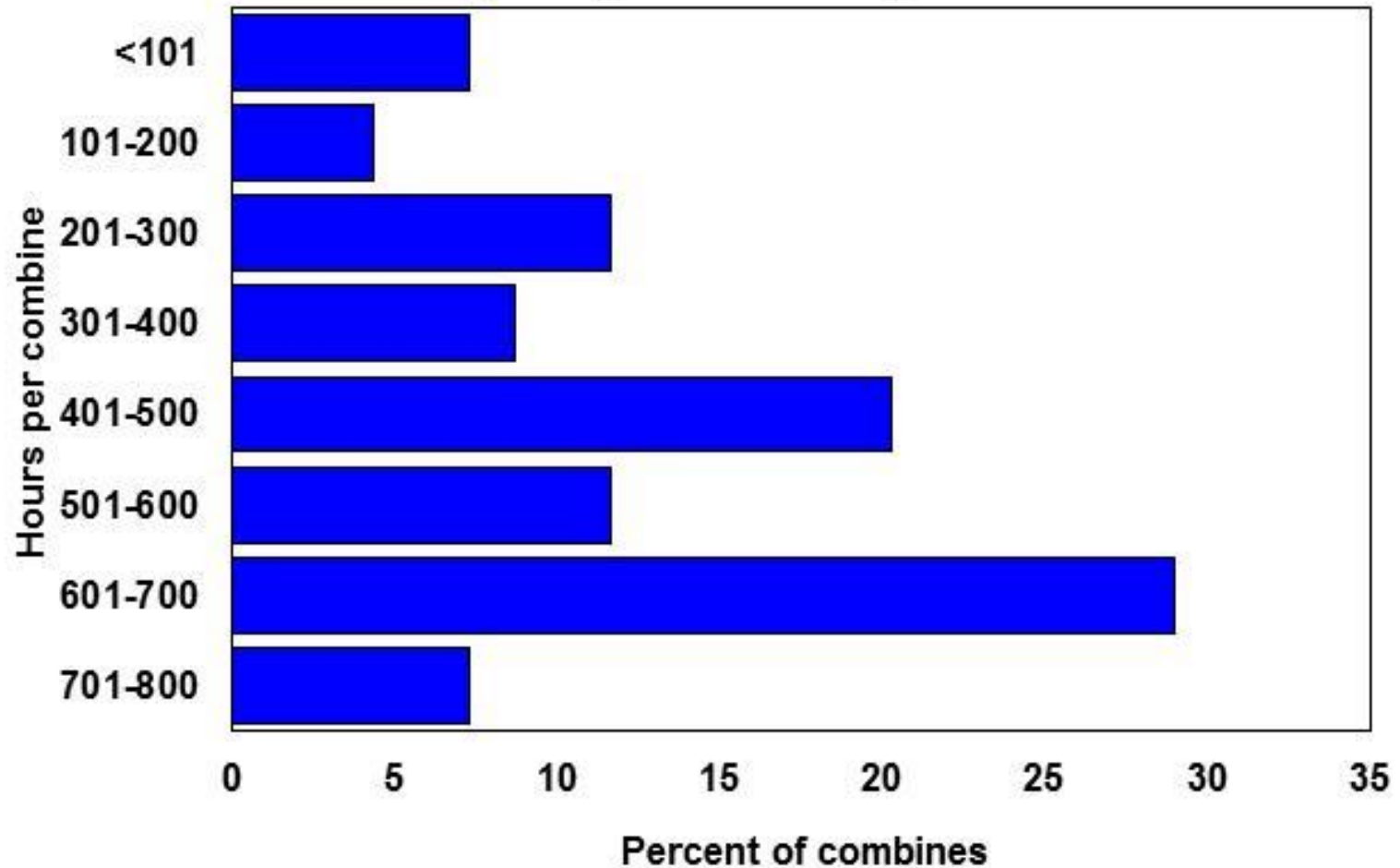
## Method of Ownership of Combines

(total = 69)



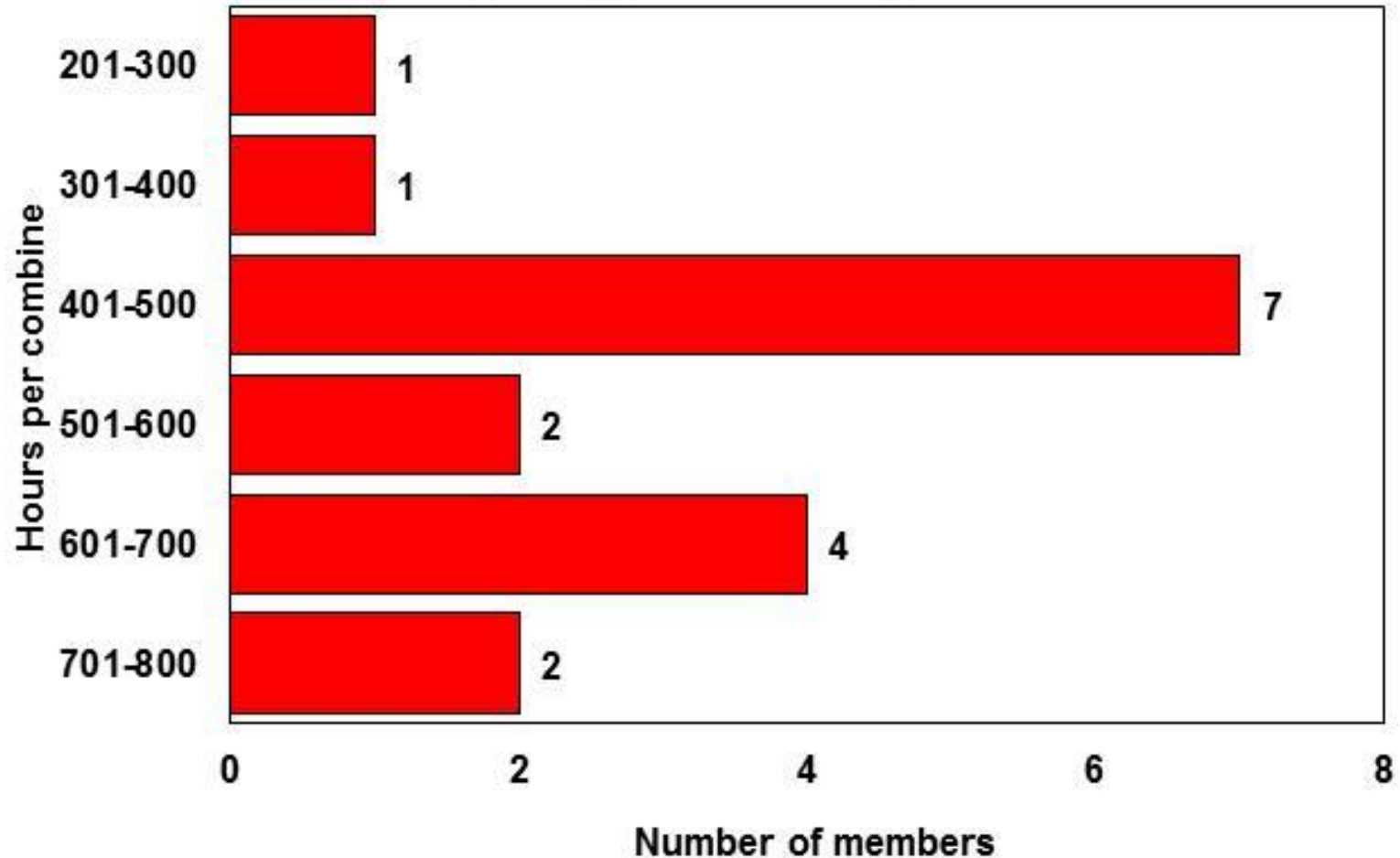


### Combine use -- separator hours in 2016 (average = 475 hours)



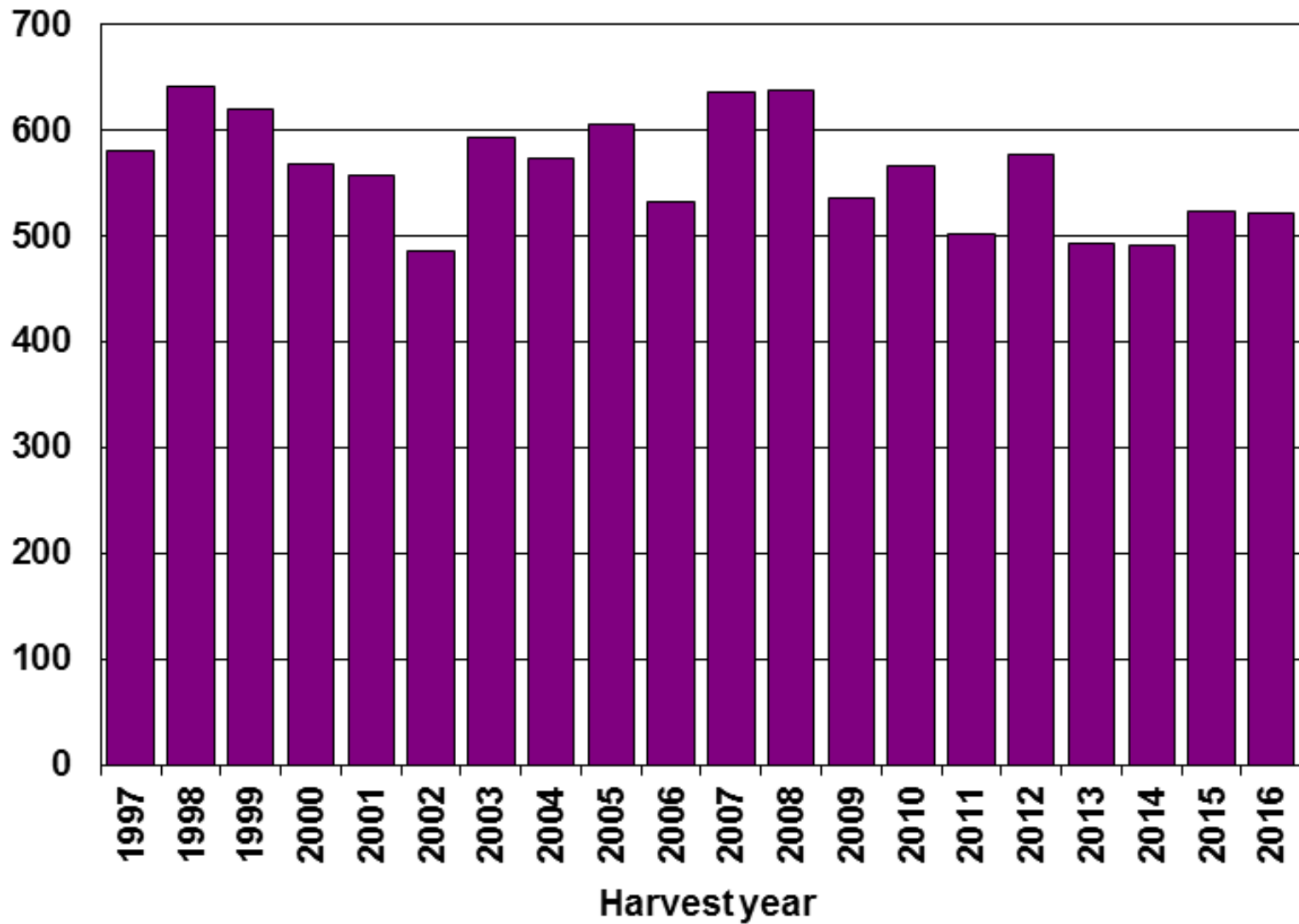
**Average engine hours = 676 hours (sep/eng = 70.6%)**

**Tot. hrs. per member/(no. of machines operated)  
(average = 521 hours)**

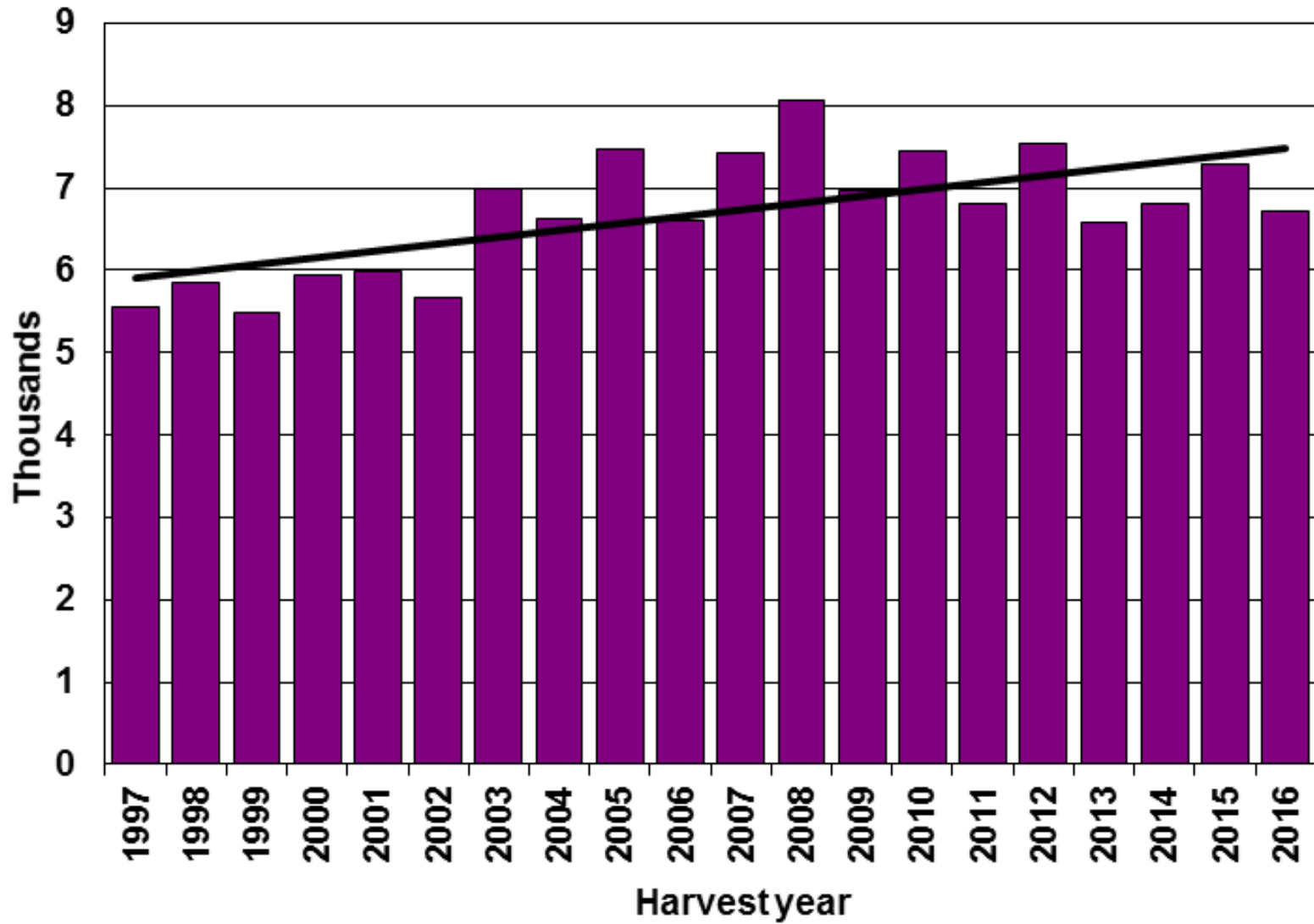


**Average engine hours = 742 hours (sep/eng = 70.2%)**

## Hours per combine

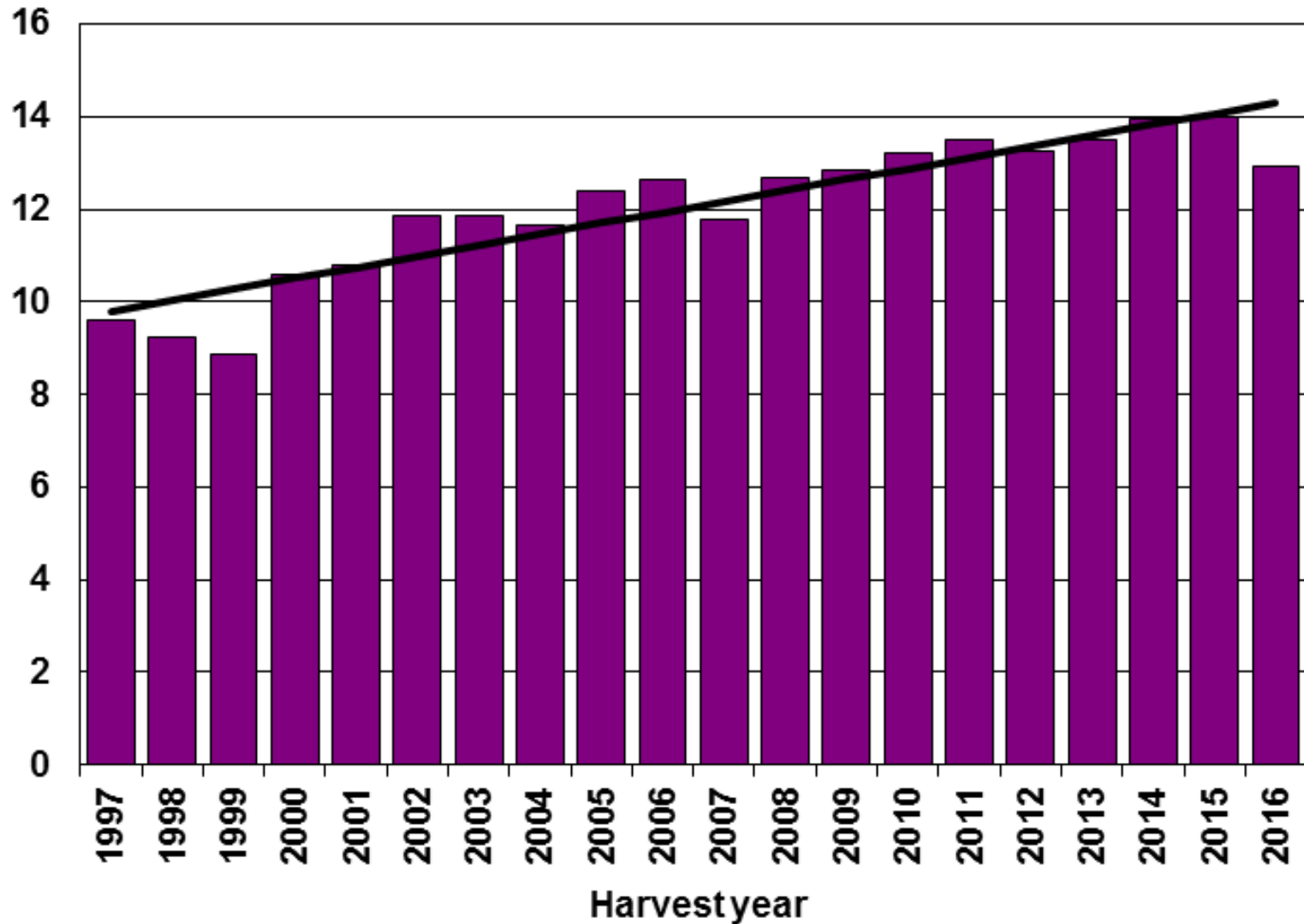


## Acres harvested per combine



Increase of 83 acres per year

## Acres harvested per separator hour



Increase of 0.24 acres/hour per year

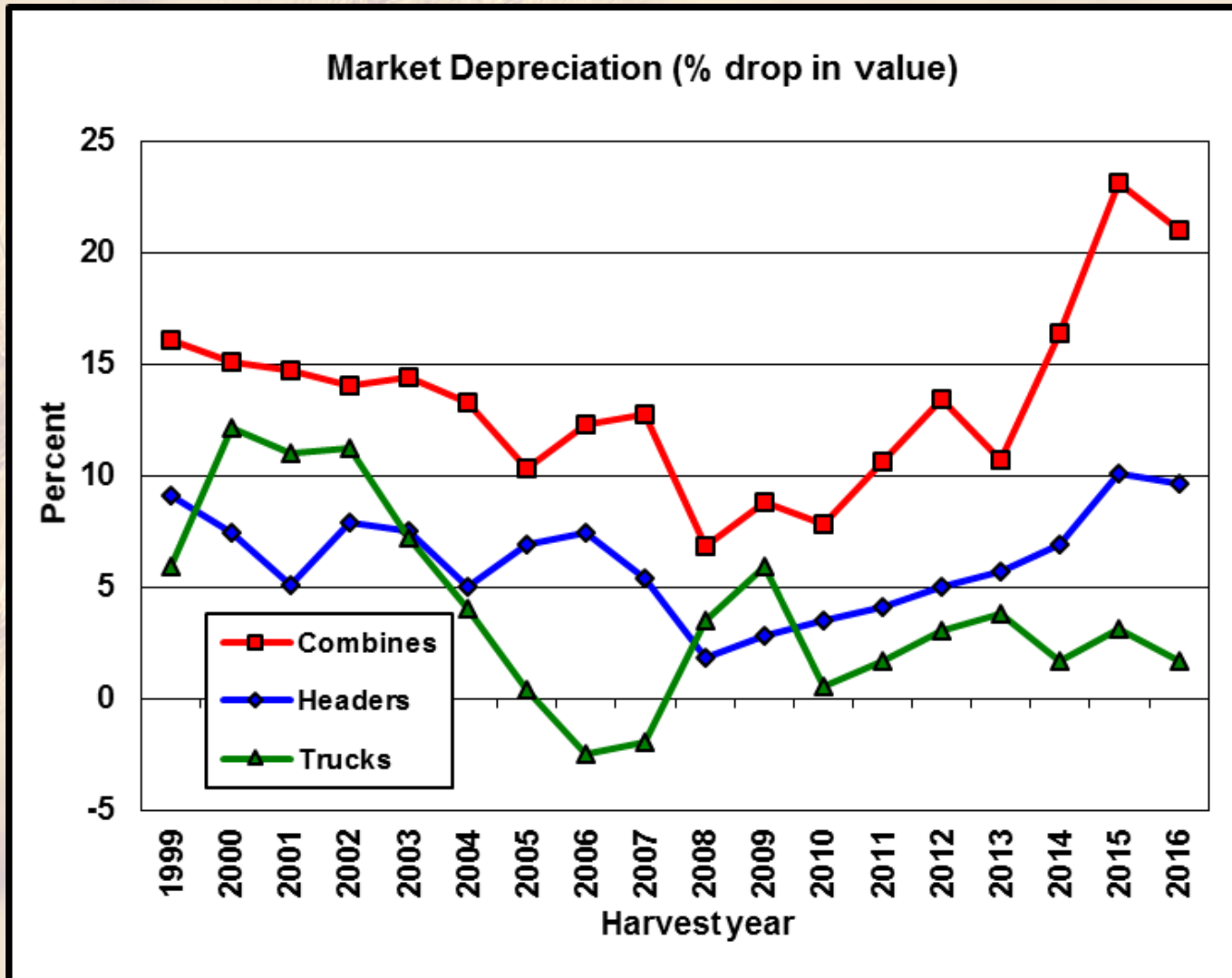
# Grain Truck Information (106 total)

- **Average year** **2002.1**  
(2015-2000.8; 2014-1999.0; 2013-2000.3; 2012-1998.7; 2011-1998.8)
- **% Tandems** **10.4%**
- **% Semis** **88.7%**
- **% owned** **100%**
- **Avg. mi. in 2016 (90 total)** **12,740**  
(2015-13,729; 2014-11,828; 2013-11,635; 2012-12,745; 2011-12,815)
- **Avg. miles on truck at end of year**
  - **(84 total): 544,973**  
(2015-572,817; 2014-619,193; 2013-526,796; 2012-592,749; 2011-583,441)

# Value of Assets per Combine Operated

|  |                         |
|--|-------------------------|
| • <b>Combine</b>                       | <b>\$208,989</b>        |
| • <b>Platforms</b>                     | <b>\$104,251</b>        |
| • <b>Other equipment (trucks, etc)</b> | <b><u>\$248,824</u></b> |
| <b>Sub Total</b>                       | <b>\$562,064</b>        |
| <br>                                   |                         |
| • <b>Other assets (balance sheet)</b>  | <b><u>\$21,268</u></b>  |
| <b>TOTAL</b>                           | <b>\$583,332</b>        |

# Equipment depreciation



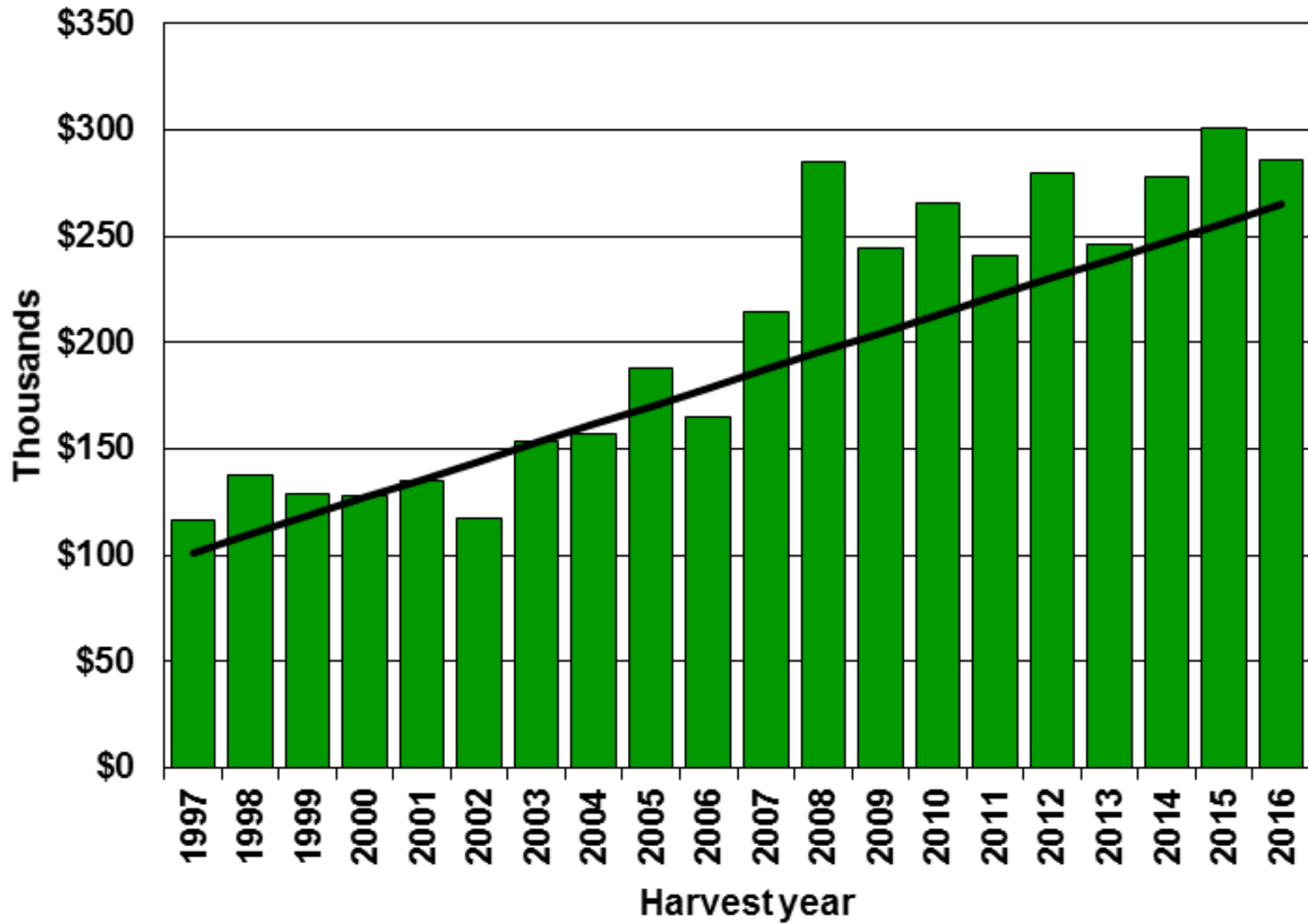
|                 | 2016        | 2015        | 2014        | 2013        | 2012        |
|-----------------|-------------|-------------|-------------|-------------|-------------|
| <b>Combines</b> | <b>21.0</b> | <b>23.1</b> | <b>16.4</b> | <b>10.7</b> | <b>13.5</b> |
| <b>Headers</b>  | <b>9.6</b>  | <b>10.1</b> | <b>6.9</b>  | <b>5.7</b>  | <b>5.0</b>  |
| <b>Trucks</b>   | <b>1.7</b>  | <b>3.1</b>  | <b>1.7</b>  | <b>3.8</b>  | <b>3.0</b>  |



# Revenue Information

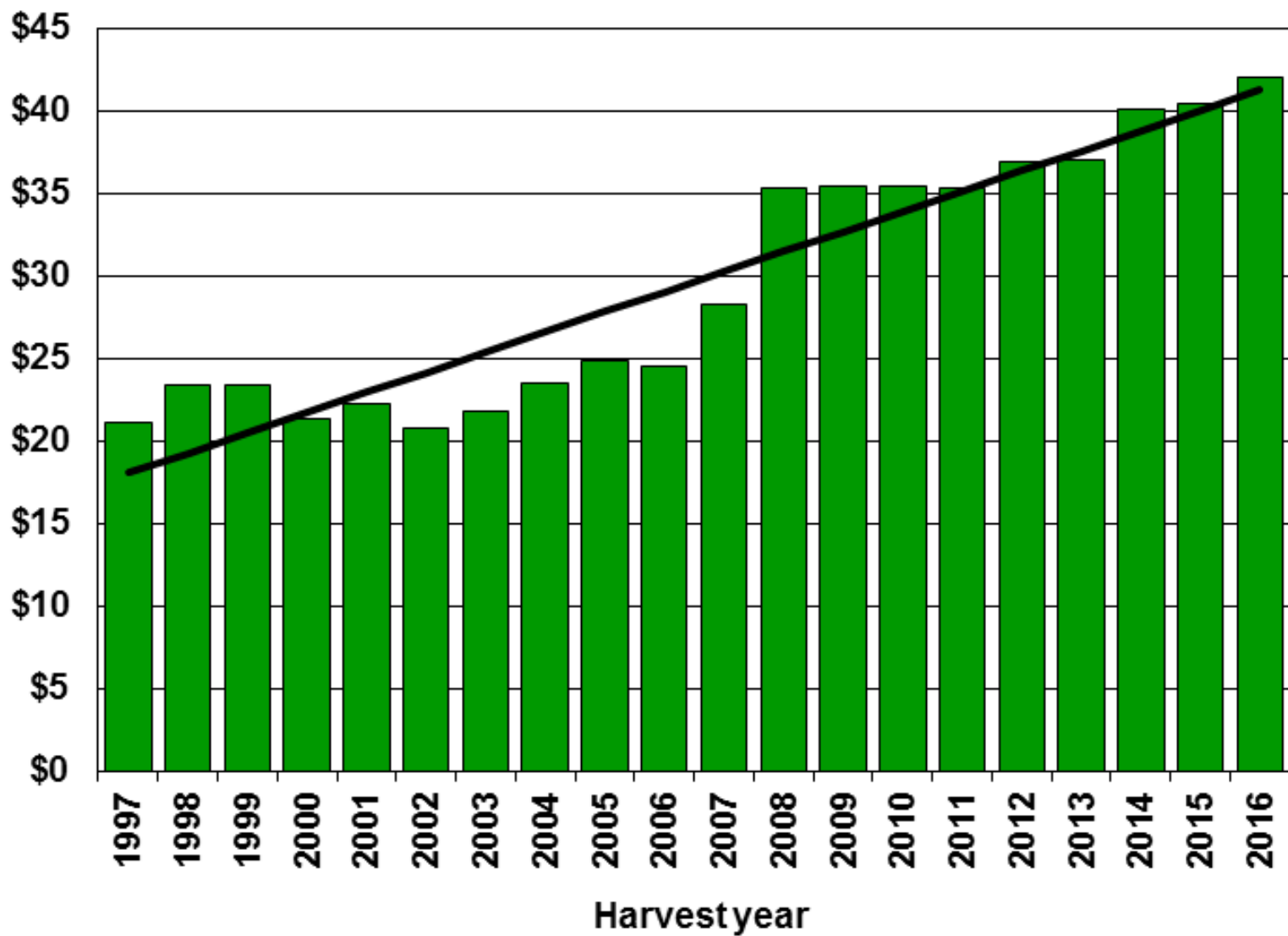
|                       | <u>Combine</u>   | <u>Acre</u>    | <u>Hour</u>     |
|-----------------------|------------------|----------------|-----------------|
| <b>Harvest</b>        | <b>\$281,413</b> | <b>\$41.45</b> | <b>\$533.55</b> |
| <b>Combine rental</b> | <b>\$0</b>       | <b>\$0.00</b>  | <b>\$0.00</b>   |
| <b>Other</b>          | <b>\$4,097</b>   | <b>\$0.55</b>  | <b>\$6.86</b>   |
| <b>Total</b>          | <b>\$285,509</b> | <b>\$42.00</b> | <b>\$540.41</b> |

## Revenue per combine



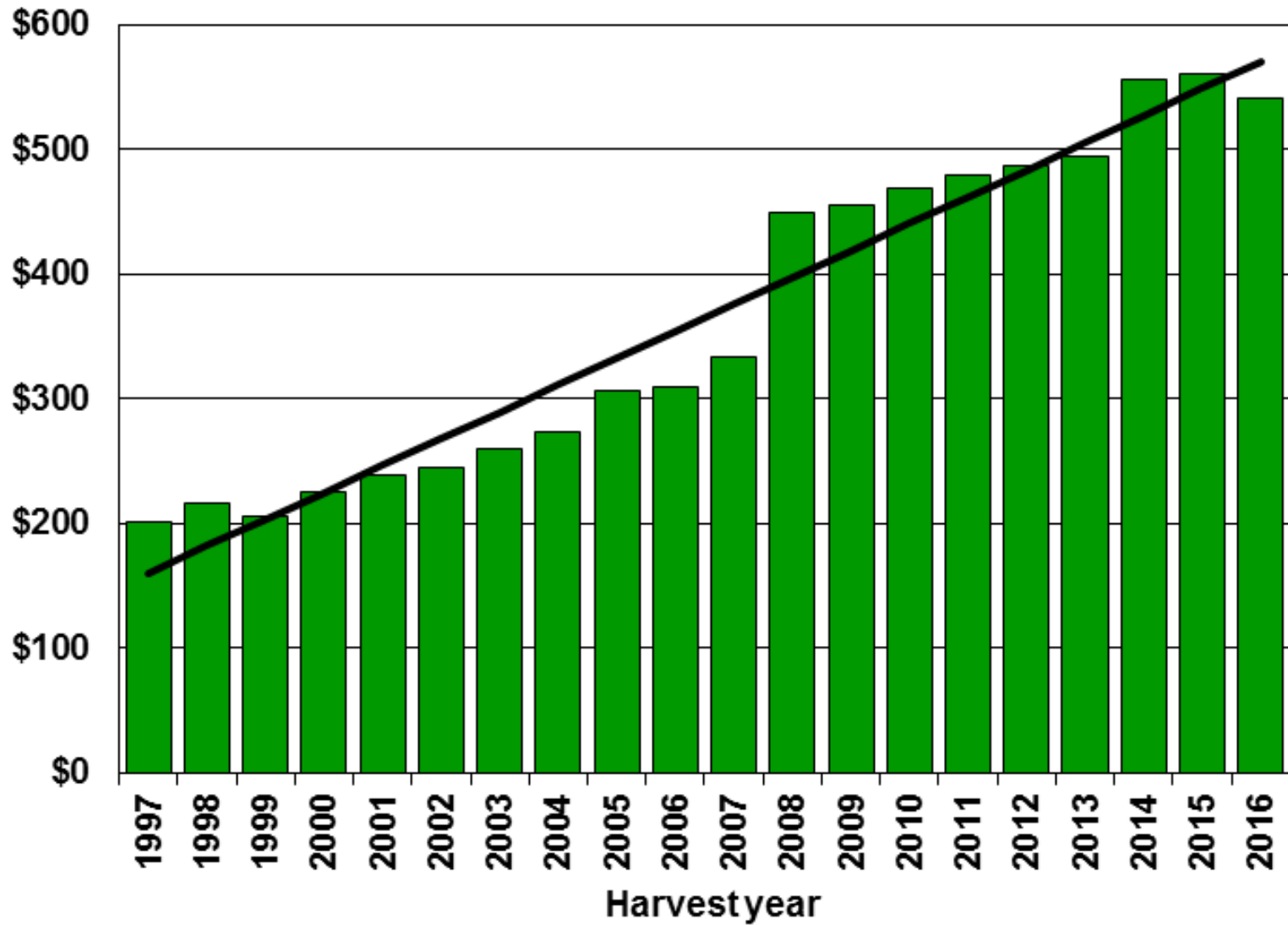
Increase of \$10,544 per year

## Revenue per acre



Increase of \$1.22 per year

## Revenue per hour

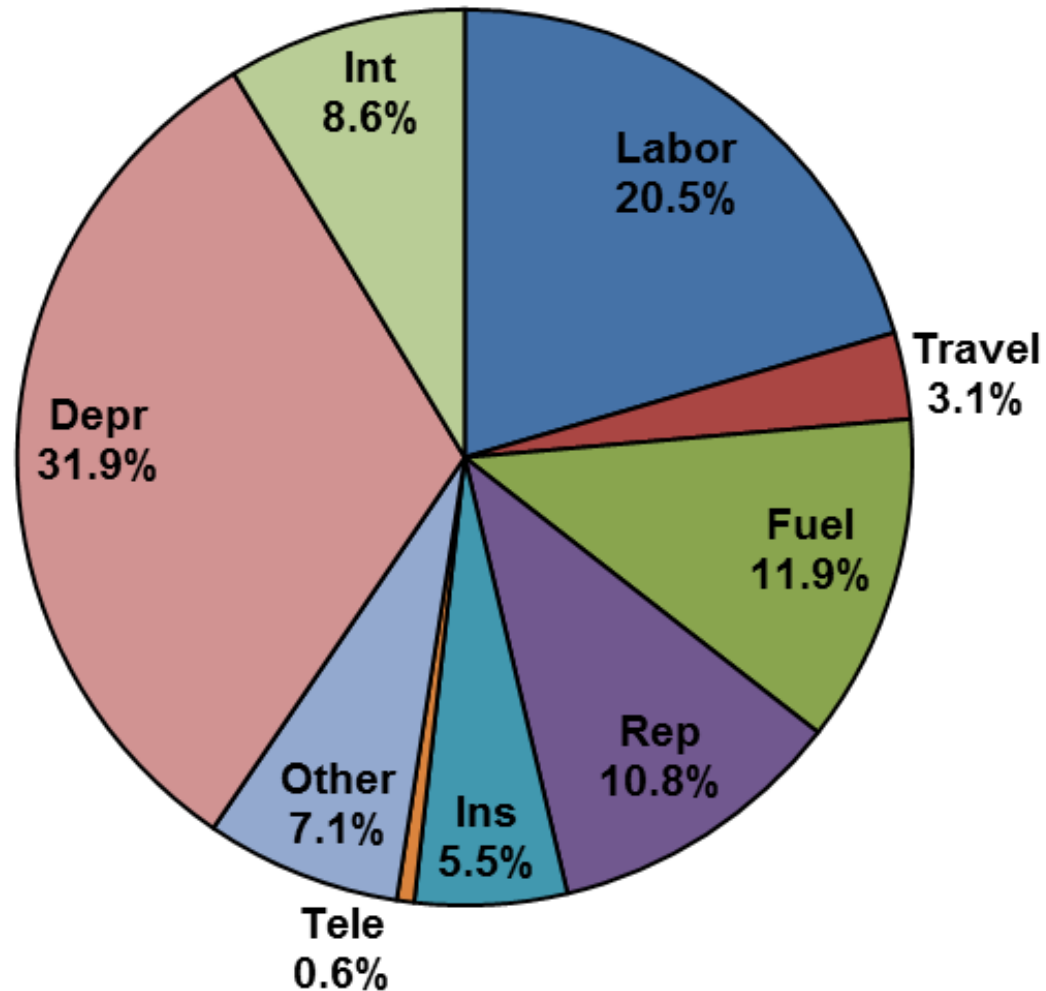


Increase of \$21.56 per year

# Operating Expense Information

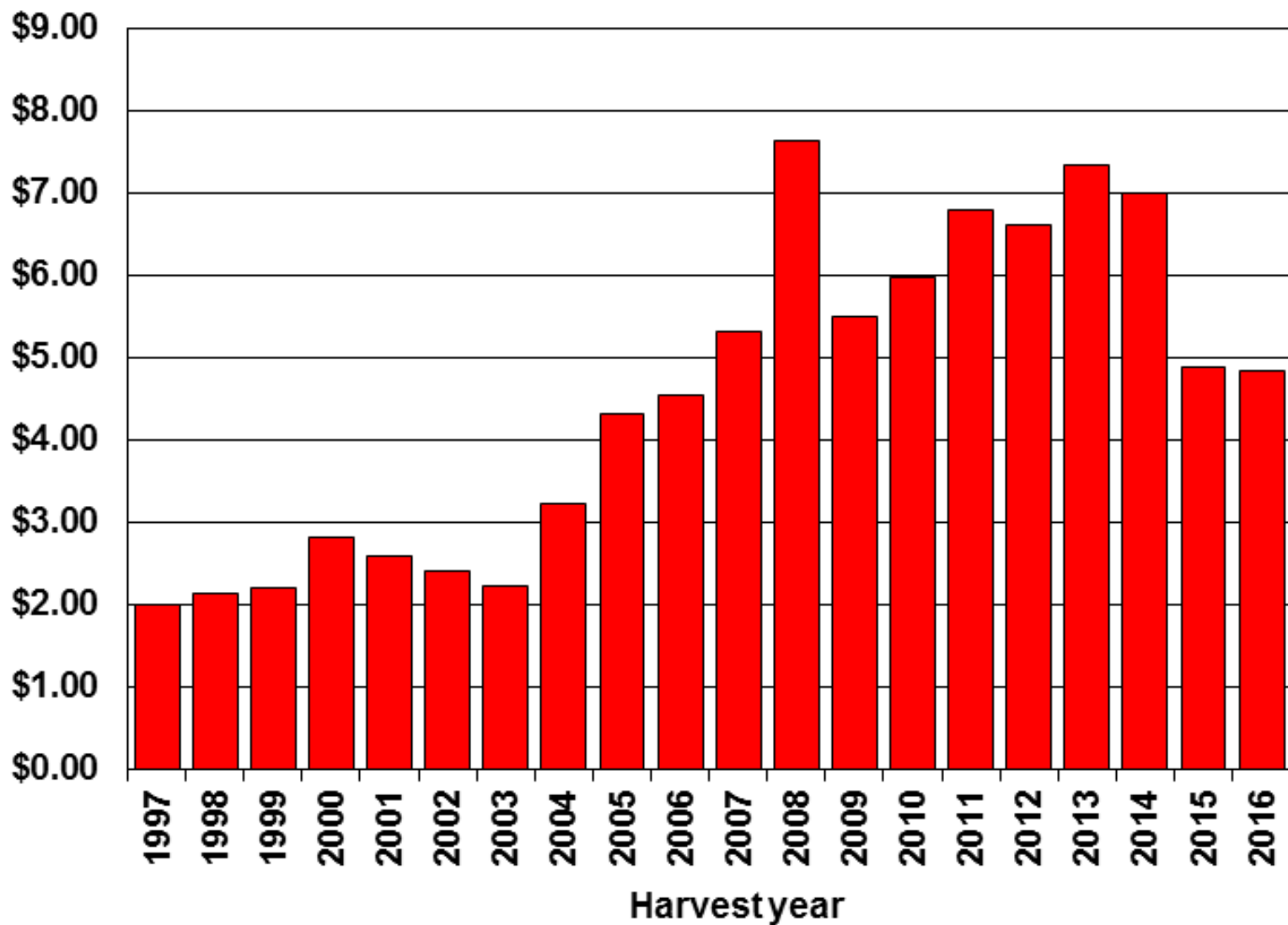
- **Labor (paid and unpaid)**
- **Travel**
- **Fuel and Lubrication**
- **Repair and Maintenance**
- **Insurance**
- **Telephone and Utilities**
- **Machine hire and lease**
- **Other Expenses (prop tax, tags/permits, shop rent)**
- **Market Depreciation**
- **Interest on Assets (assigned)**

## Distribution of expenses/acre (total=\$40.73)

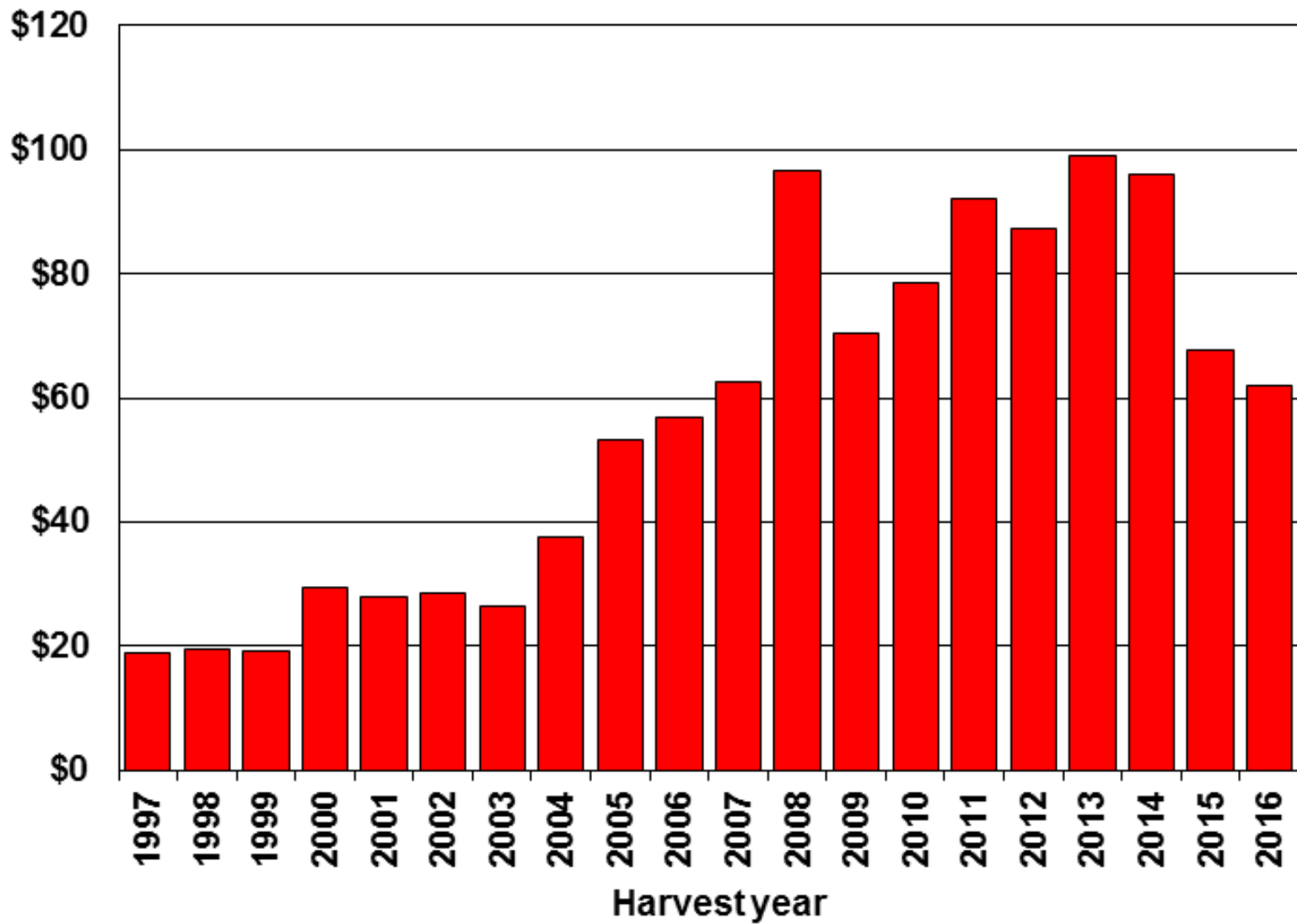


Compared to \$37.65 in 2015 (Dep = 31.8%; Labor = 19.3%; Fuel = 12.9%)

## Fuel per acre

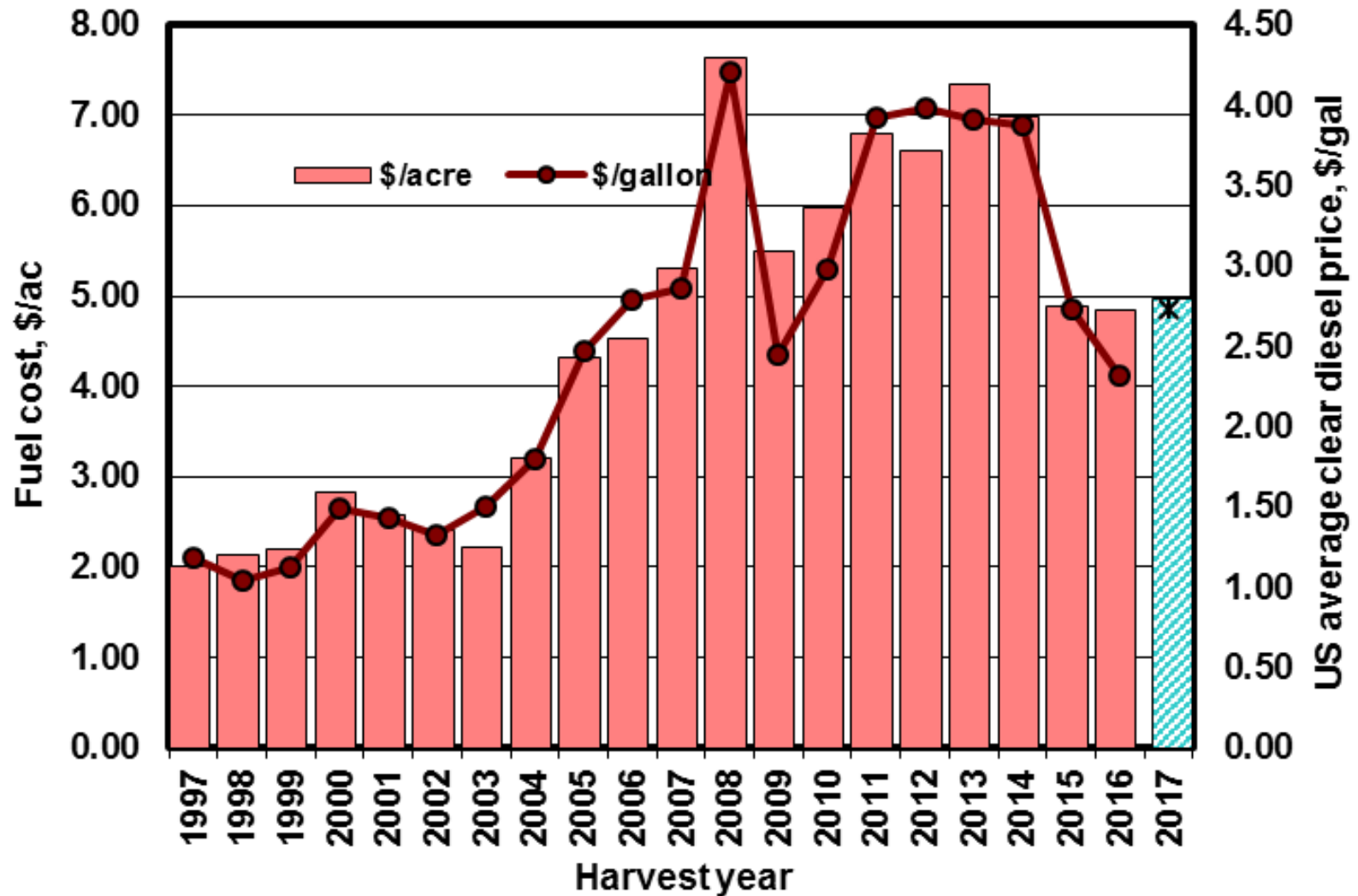


## Fuel per hour

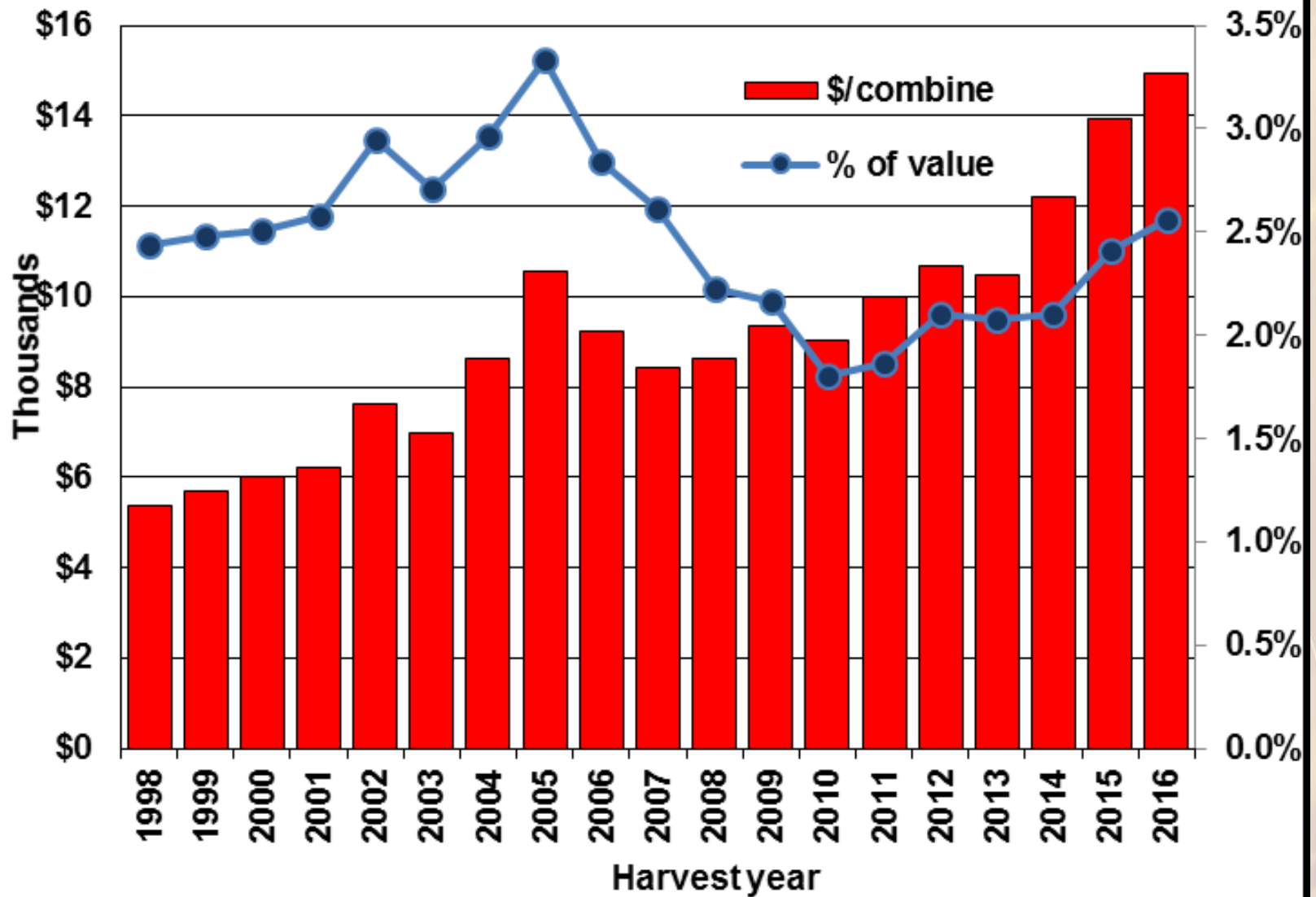




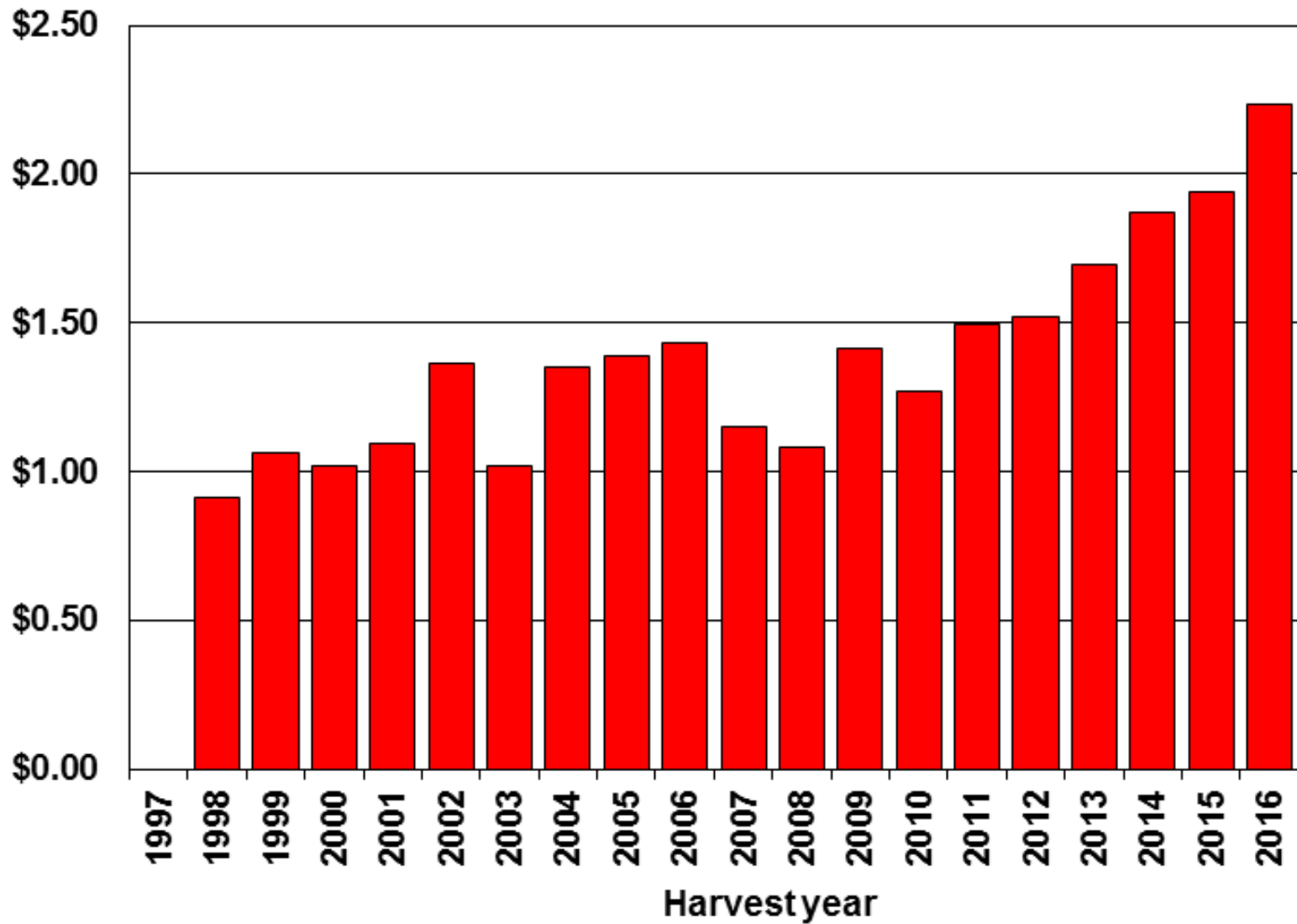
## Per Acre Fuel Costs vs Clear Diesel Price



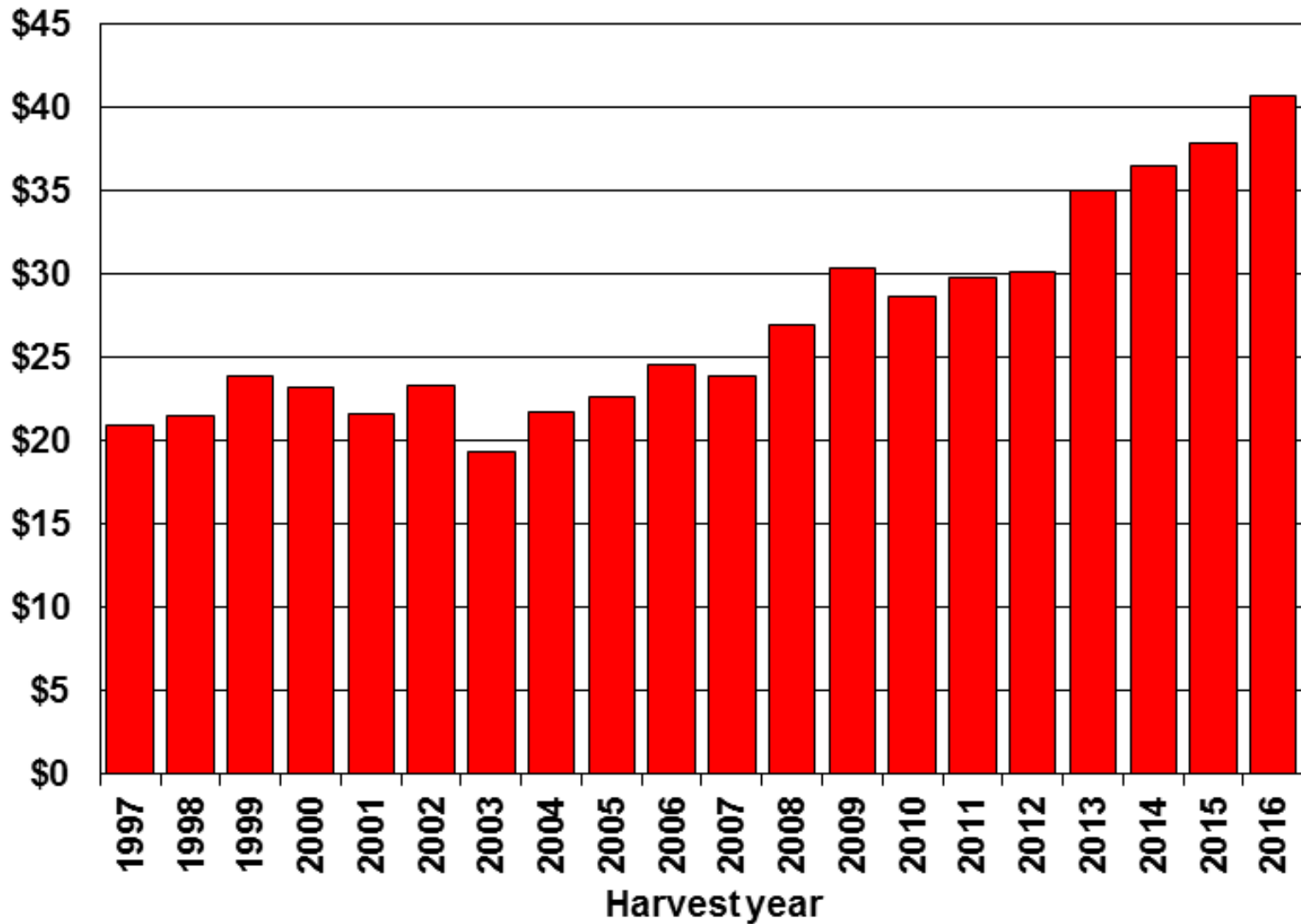
### Insurance cost per combine



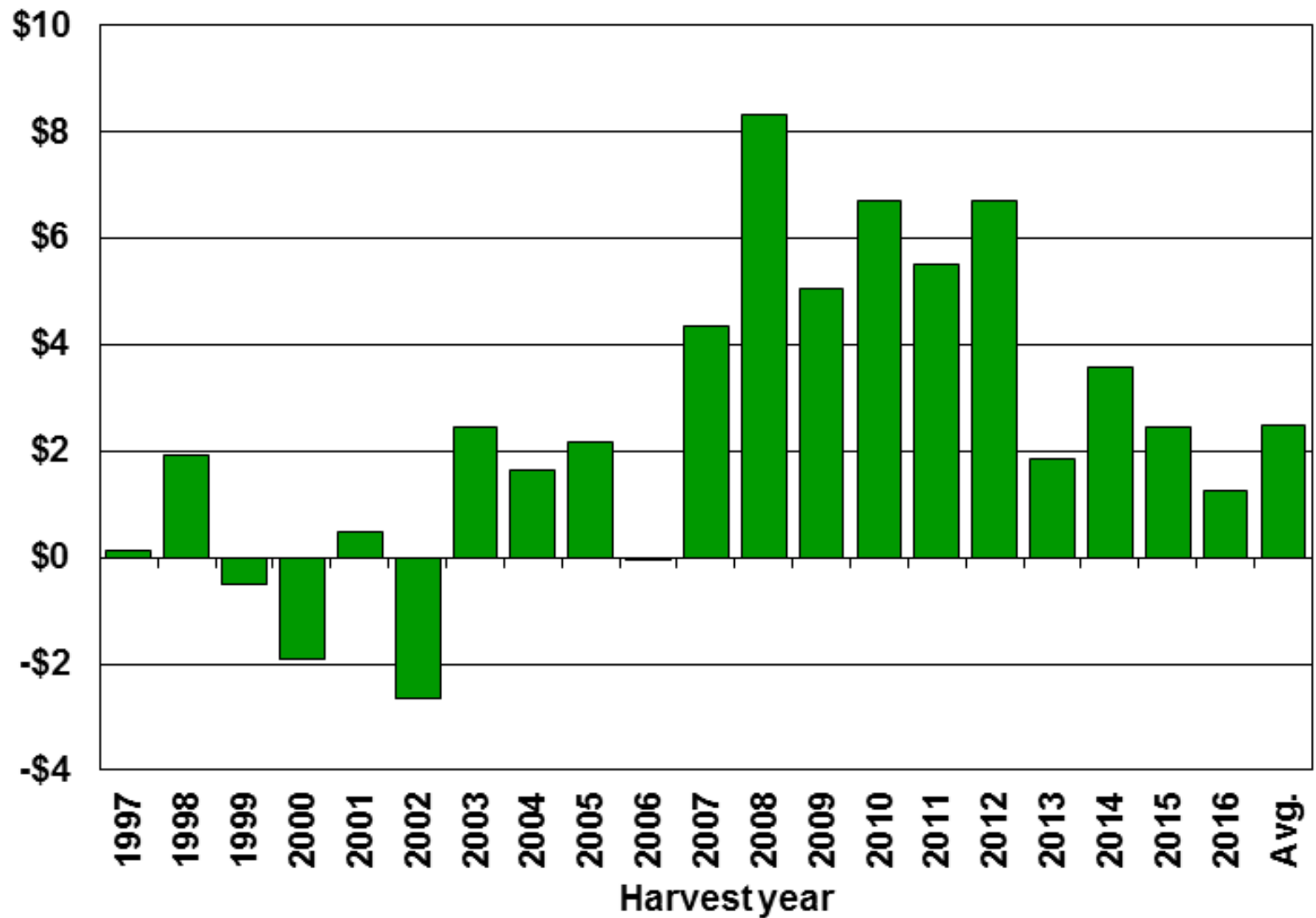
### Insurance cost per acre



### Total cost per acre

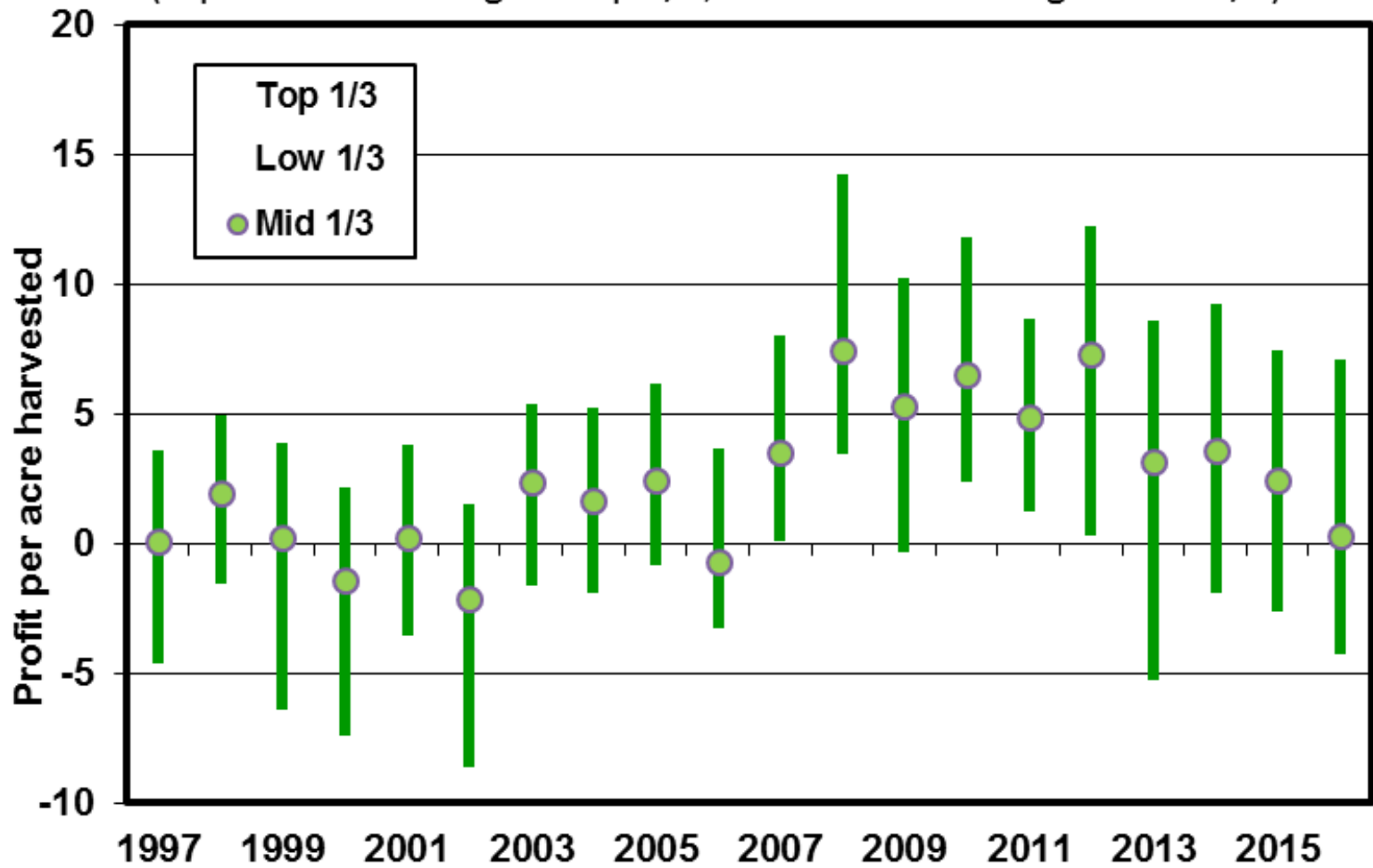


## Profit per acre



## Variability of Profit for Custom Harvesters in CHAMP

(top of the bar is avg for top 1/3, bottom of bar is avg for low 1/3)



# Profit and Financial Ratios

- Profit = revenue - expense

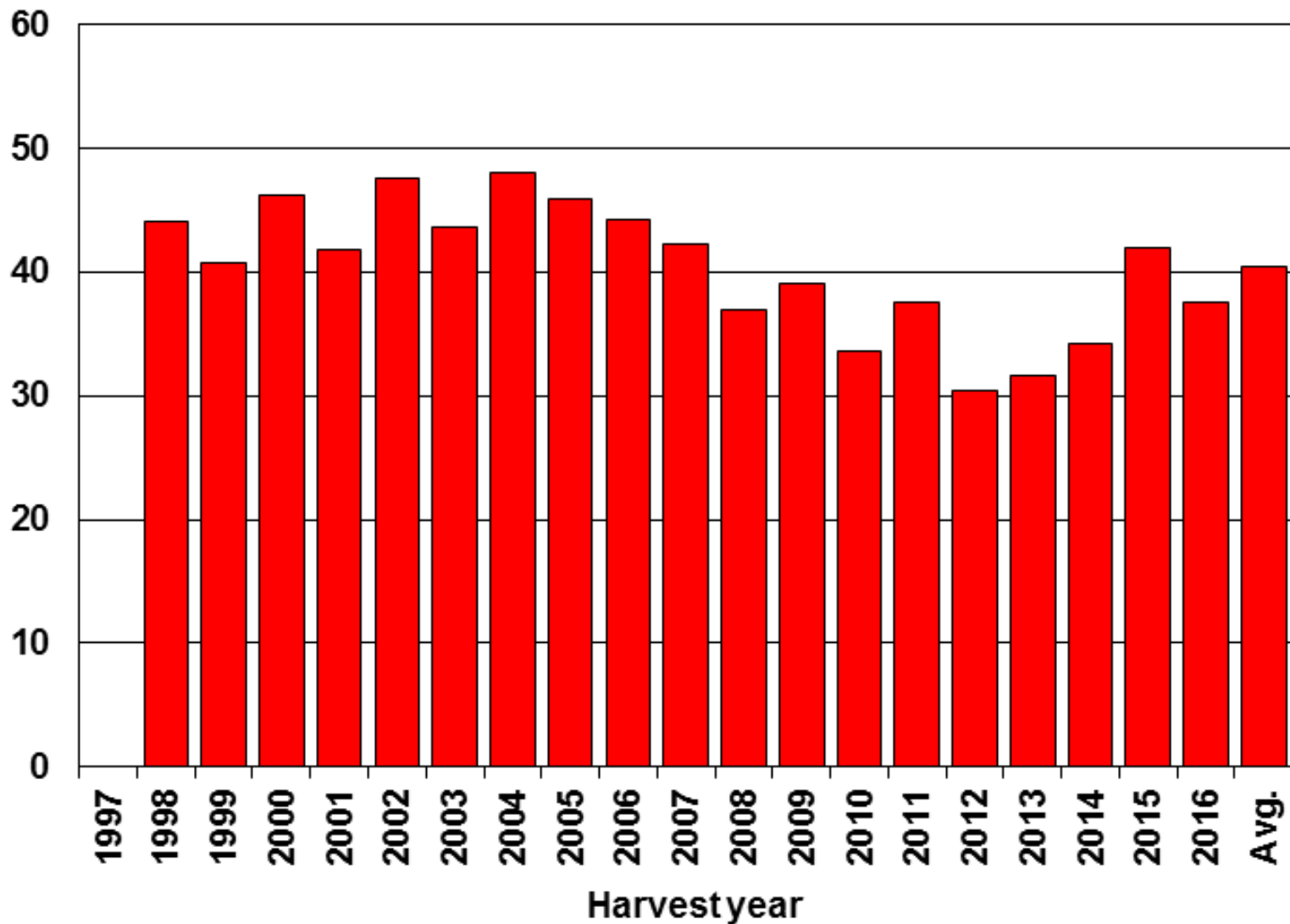
- Debt-to-assets (D/A) =

$$\frac{\text{total liabilities}}{\text{total assets}}$$

- Return on Assets (ROA) =

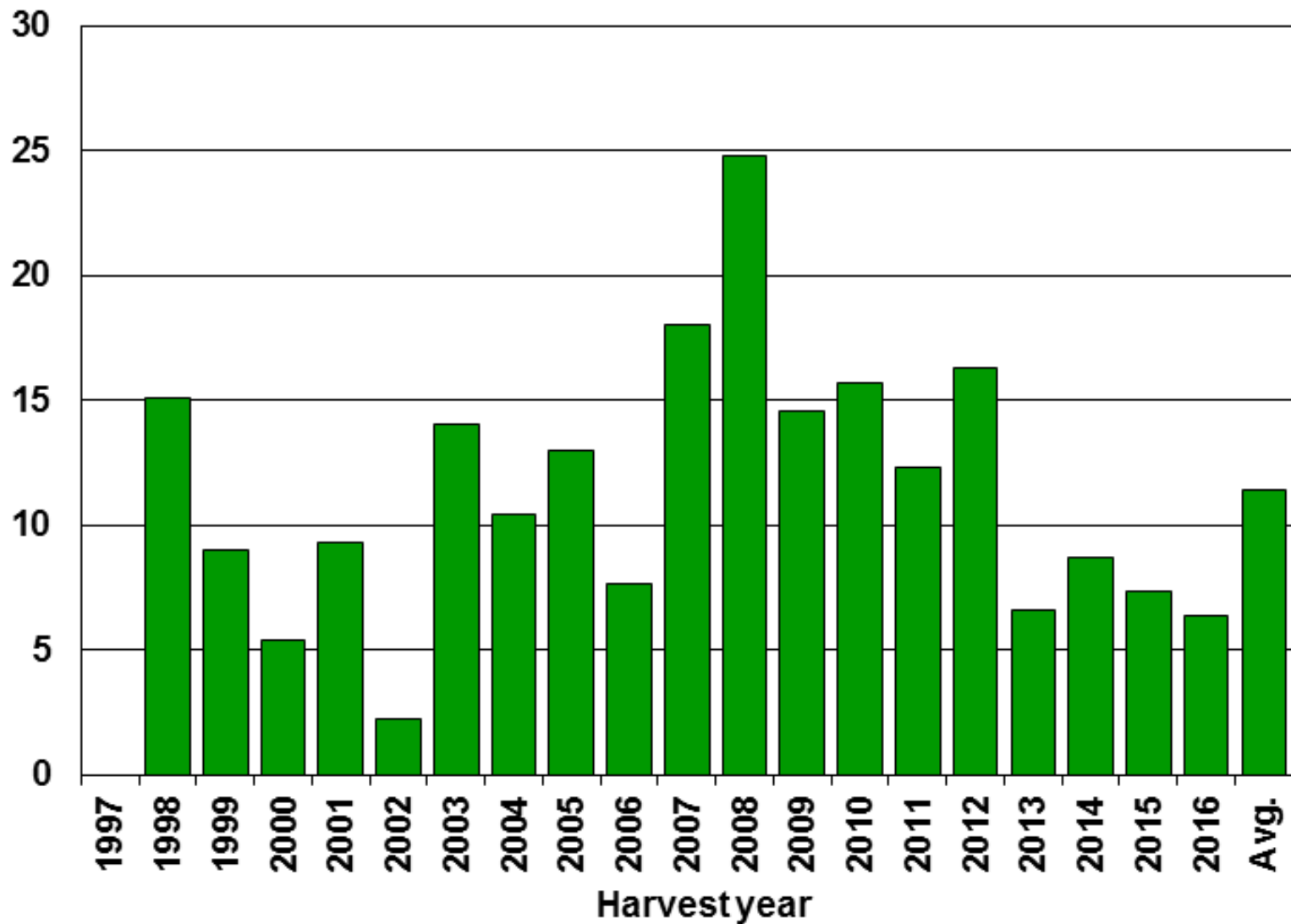
$$\frac{\text{profit} + \text{interest}}{\text{average assets}}$$

### End of year debt-to-asset, %





## Return on assets percent



# Summary Findings

- A slight reduction in hours of use per combine over the years
- Harvesters less inclined to purchase insurance from same place they purchase machinery
- Increasing number of acres covered
  - Likely due more to increased machinery capacity than increased # of machinery units or increased labor
  - Acres harvested per separator hour increased 0.24 acres/hr per year
- Autosteer adoption much higher than yield mapping
- Wheat acreage (%) has remained stable while wheat's relative importance across the region has declined
  - Custom harvesting has comparative advantage in small grains relative to other crops
- No clear statistical conclusions on tradeoffs between depreciation and repairs
- 20-year average profit of \$2.41/acre

# **Questions?**

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